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REVIEWS OF RECENT LITERATURE.

PSYCHOLOGY.

Individual Psychophysiology of the Crayfish. — In what sense, if at all, may the term "individuality" be applied to the crayfish? is the question which Dr. Dearborn¹ has attempted to answer experimentally.

Starting with the definition, "a living organism is an individual in proportion to the relative constancy and strength of its own proper tendencies considered as manifestations of an inherent will," the writer, by studying the individual reactions of about twenty representatives of *Cambarus affinis*, arrives at the conclusion that there is no evidence of psychic individuality.

The experiments upon which this conclusion rests are: 1. The determination of traction strength, or the pulling power of the animal. The traction power per gram of body weight varies from 1.7 to 3.5. Three tests were made for each individual on different days, and great variation is noticeable. 2. The pinching power of the chelæ. 3. Returning habits; the crayfish being placed on its back on a *glass plate* and *allowed to right itself if possible*. In this, too, there is remarkable variability. It is an interesting and suggestive experiment, by the future use of which much should be learned concerning the mechanism of the crayfish. 4. Training in the returning habit. Training was given in a particular method of returning, but with negative results. 5. Reactions to galvanism. 6. Galvanotropism. The animals invariably go to the cathode, although at widely differing rates. 7. Hypnosis. Crayfish are easily hypnotized by holding them firmly in a stable position for a short time. Dr. Dearborn emphasizes the fact that the time necessary for hypnosis varies greatly in different animals and in the same animal from time to time, as does also the duration of the hypnotic influence. He differs from Verworn in holding the process of hypnosis in the crayfish to be the same as human hypnosis. 8. Reaction time. The reaction of the forceps of the chelæ to tapping on some part of the shell (the

¹ Dearborn, G. V. N. Notes on the Individual Psychophysiology of the Crayfish, *Amer. Journ. of Physiol.*, vol. iii, No. 9 (1900), pp. 404-433.

place of stimulation is indifferent, the writer states) was determined for ten animals, and found to vary from .20 second to .65.

A comparative study of the results of these experiments "fails to discover anything . . . so far comparable to individual temperaments" as "sensitive and weak" or "dull and strong." "Absence of correlations and inconstancy are the two significant features of the results."

The value of this work, it would seem, lies chiefly in its suggestiveness. Almost every page of the report points out some line of work which might claim months of careful study. Much of the evidence furnished by the experiments seems to us inconclusive because of an insufficient number of observations. Dr. Dearborn has, by the use of the "extensive" method, exposed himself to the criticism "fragmentary and superficial."

R. M. Y.

The Problem of Innate Ideas.—The third of Dr. Ad. Wagner's *Studien und Skizzen aus Naturwissenschaft und Philosophie*¹ is a philosophic discussion of "innate ideas." Of the two earlier papers of this series the first dealt with scientific thought and popular science, the second with the problem of free will.

Dr. Wagner calls attention to the far too common avoidance of fundamental problems by natural scientists . . . "der Naturgelehrte meistens sagen: Ach was! Ich bin Naturforscher. Lasst mich mit Eueren philosophischen Problemen in Ruhe! Die gehen mich nichts an."

In this short essay the nature of knowledge is very clearly and concisely treated. In many respects Wagner's standpoint is Kantian. He considers space, time, and causation "forms" of thought. The latter part of the paper is devoted to the relations of the brain as the organ of mind to the "*a priori*" (commonly so-called) of knowledge.

R. M. Y.

Empirical Teleology.²—It seems unfortunate that Cossmann should have chosen a title so unattractive to the majority of biologists as "Elements of Empirical Teleology," for there is much in his book worthy of their attention.

¹ *Ueber das Problem der angeborenen (apriorischen) Vorstellungen.* Berlin, Gebrüder Borntraeger, 1900. 77 pp.

² Cossmann, Paul Nikolaus. *Elemente der empirischen Teleologie.* Stuttgart, A. Zimmer, 1899. 132 pp.